August 2, 2002

DRAFT
Scope of Work
SCAG Arterial Speed Study

Background

The Southern California Association of Governments (SCAG) is the largest council of governments in the United States, and functions as the Metropolitan Planning Organization (MPO) for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The Region encompasses a population exceeding 15 million persons in an area of more than 38,000 square miles. SCAG maintains and applies the Regional Transportation Model to support the Region's various plans, programs, and major projects. The Model provides an analytic tool for examining future mobility issues and determining the resulting air quality impacts.

The impetus for this project is the increasing significance of travel demand model speeds on emission estimates used to establish attainment demonstrations in the AQMP/SIP and to develop conformity determinations. SCAG has recently embarked on a major model improvement program that addresses nearly every aspect of the Regional Transportation Model. The range of model improvements (e.g., new socioeconomic data, increased number of traffic analysis zones, expanded modeling network, new free flow speeds, addition of new heavy-duty vehicle forecasting module, etc.) has made it difficult to discern their collective effect on speed and highlights the need for an independent check on speed estimates produced by the Model.

SCAG recently contracted with the firm Sierra Research to review available speed measurement/monitoring systems operating in the SCAG Region. The objective of the review was to determine the technology employed in collecting the speed data, the roadways covered, the techniques used to verify the results, and the time periods represented in the collected data sets. Sierra Research's review of available speed monitoring systems concluded that there is no single data source that provides uniform coverage of arterials in the SCAG Region. The Final Report recommends that a program for regularly collecting speed data on the Region's arterial system be instituted.

SCAG seeks Consultant assistance in developing a methodology to gather speed data for the arterial system within the SCAG Region. In addition, the Contractor will be asked to begin building a comprehensive database of measured speeds for validating the model speeds and tracking speed changes over time.

Project Objectives

- Select a methodology for gathering speed data for the various levels of arterials throughout the SCAG Region.

- Determine the number of sample sites necessary to validate the Regional Model's output speeds.

- Conduct a Pilot Survey to demonstrate the practicality of the methodology and begin building the Regional speed database.

- Develop a program to continually gather speed measurements to update the Regional Arterial Speed database and monitor speed changes over time.

Work Tasks

Task 1 Project Work Program

Within a week of receipt of authorization to proceed, the Contractor will meet with SCAG's project manager and other project participants to review the work program and identify any revisions and clarifications that may be necessary. Within 10 days following this initial project meeting, the Contractor will complete such revisions to the work program as may be requested by SCAG and will develop a detailed plan for the management of the project, identifying, for each task and subtask, specific work elements, schedules, personnel assignments, costs, milestones, and quality control measures. The Project Work Program should be structured so that work progress and expenditures for each element can be tracked independently. The revised work program will be subject to approval by both SCAG and the Technical Review Committee and will constitute the first project deliverable.

Product – Project Work Program

Task 2 Project Organization

The project management team includes:

- Project Manager: The SCAG Project Manager for this project is Dr. Deng Bang Lee, Manager of SCAG's Transportation Modeling and GIS Section.

- SCAG's Modeling Task Force: The Contractor will make two presentations to SCAG's Modeling Task Force: 1) at project initiation to discuss the proposed project methodology and 2) at the completion of the project to present the Final Report and discuss the project's findings. Modeling Task Force meetings are held at SCAG's office in Los Angeles.

- Project Technical Review Committee: This Committee will be composed of approximately 15 members from SCAG's Modeling Task Force. The Contractor will organize monthly meetings of the group to review progress, provide direction on methodology, and review interim products. The Contractor will be responsible for developing and distributing the meeting agendas and meeting summaries. All Committee Meetings will be held at SCAG's Los Angeles Office.

Task 3 Project Administration

- The Contractor will prepare monthly progress reports describing completed work products. Progress reporting will be coordinated with project invoicing.

- Quality Control - The Contractor will develop quality control measures to insure the accuracy of all products. The measures will be presented to the Technical Review Committee for review and approval.

- Project methodologies and work products will be reviewed and accepted by the Technical Review Committee.

- Schedule - It is expected that the selected Contractor will be under contract to SCAG and start work after the contract is approved. The project will be completely finished and all products delivered to SCAG nine months after the contract is approved. As part of the proposal, the Contractor shall develop a detailed schedule, noting any differences with the above-proposed schedule.

- Invoices and Payment - The Contractor will submit invoices monthly for actual costs incurred, accompanied by a detailed progress report. SCAG will review the progress reports and invoices, and will issue payment within 30 days of receipt of complete and correct invoices. Contractors must provide evidence of sufficient financial resources to accommodate payment cycles of 30 days in their proposals.

- Products – All deliverables, intermediate products, electronic files, and final reports are the property of SCAG. SCAG will have sole authority to release project materials and project results to outside parties, including, but not limited to, the press.

Task 4 Speed Monitoring Methodology

The Contractor will determine a cost-effective methodology for gathering average speed data on arterials throughout the Region. Speed data is required for the various area types within the SCAG Modeling Area. SCAG's Modeling Area includes Los Angeles, Orange, Ventura, and the urbanized portions of San Bernardino and Riverside Counties. Speed data will be further broken down by arterial type and time period. SCAG's

modeling time periods include: AM peak period (6:00 – 9:00 AM), PM peak period (3:00- 7:00 PM), mid-day, and nighttime. Speeds produced by the model represent an average weekday speed. In addition to average weekday, the Contractor will also collect weekend and summer season speed data.

Because of the size of the SCAG Region, it is expected that a manual collection method will not be capable of developing the uniform/comprehensive speed database needed for model validation. A technological solution should be investigated to efficiently collect and maintain the speed database over time. The Contractor will compare the proposed methodology with other speed collection methods, identifying the pros/cons of each potential approach. The proposed methodology must be shown to produce technically accurate speed estimates.

The primary purpose of gathering the speed data is to compare the measured speed data against speed produced by the Model. Therefore the speed data must be consistent with speeds estimated by the model. *Model speeds are averages that include the delay at intersections. Average speed should be calculated using both link travel times and delay time at the intersections.*

Product – Technical Memorandum describing the speed monitoring methodology

Task 5 Sampling Plan

To minimize the resources expended in collecting speed data, the Contractor will define the minimum dataset required to validate/calibrate the travel demand model. The Sampling Plan will be based on the following factors: facility type, the miles and number of segments to be covered, the temporal distribution, the number of repeats and, if possible, the location of the segments to be covered. Consideration should be given to whether it is preferential to regularly collect data on the same roadways, whether a random process should be employed to ensure uniform data collection throughout the modeling domain, or whether a mixture of targets should be established.

Product – Technical Memorandum describing the Sampling Plan

Task 6 Conduct Speed Pilot Surveys

Using the proposed methodology and Sampling Plan, the Contractor will conduct the Pilot Survey. The purpose of the Pilot survey is to demonstrate the practicality of the methodology, verify the accuracy of the measured speed data, and begin to build the comprehensive speed database. Speed data from the Pilot Survey will be compared to other sources of speed data to verify its accuracy.

Product – Completed Pilot Survey and related files.

Task 7 Design an On-Going Speed Collection Program

The Contractor will develop a program to regularly collect speed data on the Regional arterial system. The program description should include a detailed explanation of the work tasks, estimated costs, staff requirements, agency roles, and a schedule for future updates.

Product – Technical Memorandum describing the Speed Collection Program

Task 8 Data Summary and Analysis

The Contractor will summarize and report speed results by facility type, area type, and time period. SCAG maintains the highway network using GIS and a Thomas Brothers Base Map. The Contractor will be responsible for transferring the speed data to the Thomas Brothers base map. SCAG will provide the Contractor a copy of the digital base map.

Product – Technical Memorandum with data summaries and the final GIS formatted speed database.

Task 9 Deliverables

a) Intermediate work products:
   - Project Work Program
   - Technical Memorandum describing the speed monitoring methodology
   - Technical Memorandum describing the Sampling Plan
   - Completed Pilot Survey and related files.
   - Technical Memorandum describing the Speed Collection Program
   - Technical Memorandum with data summaries and the final GIS formatted speed database.

b) Final Project Report - The Contractor will produce the Final Project Report documenting the study methodology, survey method, and summarized results. It is expected that the Technical Memorandums prepared for earlier tasks will form the basis of this Report. The Final Report should include the following sections, plus other sections, as the Contractor deems necessary:
   - Executive Summary
   - Project Objectives
   - Project Background
   - Design of Survey Methodology
   - Description of Sampling Plan
   - Summary of Survey Results
   - Description of on-going Speed Collection Program